

1. An improved battery cell comprising:  
a cell can having a cell casing in sealed communication with  
a cell cap and an interior cavity;  
means for insulation of said cell casing from direct contact  
with said cell cap;  
a first current collector formed of metallic foil and having  
a first planar surface and a second planar surface;  
said first planar surface in contact with said cell cap;  
a first electrode adhered to said second planar surface,  
said first electrode and said first current collector  
thereby forming a unitary structure;  
a second current collector having an upper planar surface  
and a lower planar surface;  
said second current collector formed of non-metallic  
material from a group of materials consisting of  
particle-dispersed plastic tape and plastic dispersed carbon  
tape;  
said lower planar surface in contact with said cell casing;  
a second electrode adhered to said upper planar surface,  
said second current collector and said second electrode  
thereby forming a second unitary structure; and  
a separator in contact with said upper planar surface and

said second planar surface, said separator sufficiently porous to allow passage of electrolyte therethrough in said interior cavity.

2. The improved battery cell as defined in claim 1 additionally comprising at least one of said first electrode and said second electrode being rendered fire retardant by addition of fire retardant material to actives forming said electrodes.

3. The improved battery cell as defined in claim one additionally comprising:

means to bias the first current collector against the cell cap and concurrently bias the second current collector against the cell casing.

4. The improved battery cell as defined in claim 3 wherein said means to bias the first current collector against the cell cap and concurrently bias the second current collector against the cell casing is provided by said material comprising said first current collector and said second current collector being compressed when said cell casing is in said sealed communication with said cell cap and thereafter being in biased communication with said first current collector and said second current collector.

5. An improved battery cell comprising:

a cell can having a cell casing in sealed communication with

a cell cap and having an interior cavity;

means for insulation of said cell casing from direct contact

with said cell cap;

a first current collector in said interior cavity having a

first planar surface and a second planar surface;

said first planar surface in contact with said cell cap;

a first electrode adhered to said second planar surface,

said first electrode and said first current collector

thereby forming a unitary structure;

a second current collector in said interior cavity having an

upper planar surface and a lower planar surface;

said lower planar surface in contact with said cell casing;

a second electrode adhered to said upper planar surface,

said second current collector and said second electrode

thereby forming a second unitary structure;

said first current collector and said second current

collector, both formed from one or a combination

of materials from a group of materials consisting of

particle-dispersed plastic tape, plastic dispersed

carbon tape, fiber dispersed conductive plastic and carbon tape, particle and metallic powder dispersed conductive plastic; and a separator in contact with said upper planar surface and said second planar surface.

6. The improved battery cell as defined in claim 5 additionally comprising at least one of said first current collector and said second current collector being rendered fire retardant by addition of collector fire retardant material thereto.

7. The improved battery cell as defined in claim 5 wherein said collector fire retardant material is comprised of one or a combination of a group of collector fire retardant materials consisting of aluminum trihydrate, magnesium hydroxide, decabromodiphenyl tetradecabromodiphenoxy benzene, lithium carbonate, ethylene bistetrabromophthalimide,  $C_{12}OBr_{10}$ , and  $C_{18}O_2Br_4$ .

8. The improved battery cell as defined in claim 5 wherein said collector fire retardant material is comprised of one or a combination of a group of collector fire retardant materials consisting of  $Li_2CO_3$ ,  $Na_2CO_3$ , and  $CaCO_3$ .

9. The improved battery cell as defined in claim 5 additionally comprising said first electrode and said second electrode being rendered fire retardant by addition of active fire retardant material to the active material forming one or both of said first and said second electrode.

10. The improved battery cell as defined in claim 9 wherein said active fire retardant material is comprised of one or a combination of active fire retardant materials from a group of active fire retardant materials consisting of aluminum trihydrate, magnesium hydroxide, decabromodiphenyl tetradecabromodiphenoxy benzene, lithium carbonate, ethylene bistetrabromophthalimide,  $\text{Li}_2\text{CO}_3$ ,  $\text{Na}_2\text{CO}_3$ , and  $\text{CaCO}_3$ .

11. The improved battery cell as defined in claim 6 additionally comprising said first electrode and said second electrode being rendered fire retardant by addition of active fire retardant material to the active material forming one or both said first and said second electrode.

12. The improved battery cell as defined in claim 11 wherein said active fire retardant material is comprised of one or a combination of active fire retardant materials from a group of active fire retardant materials consisting of aluminum trihydrate, magnesium hydroxide, decabromodiphenyl tetradecabromodiphenoxy benzene, lithium carbonate, ethylene bistetrabromophthalimide,  $\text{Li}_2\text{CO}_3$ ,  $\text{Na}_2\text{CO}_3$ , and  $\text{CaCO}_3$ .

13. The improved battery cell as defined in claim 5 additional comprising:

means to bias the first current collector against the cell cap and concurrently bias the second current collector against the cell casing.

14. The improved battery cell as defined in claim 13 wherein said means to bias the first current collector against cell cap and concurrently bias said second current collector against said cell casing is provided by said material forming said first current collector and said material forming said second current collector being compressed when said cell casing is in said sealed communication with said cell cap and thereafter being in biased communication with said first current collector and said second current collector.

15. An improved battery cell comprising:

a cell can having a cell casing in sealed communication with  
a cell cap and having an interior cavity;

means for insulation of said cell casing from direct contact  
with said cell cap;

a first current collector in said interior cavity having a  
first planar surface and a second planar surface;

said first planar surface in contact with said cell cap;

a second current collector in said interior cavity having an  
upper planar surface and a lower planar surface;

said lower planar surface in contact with said cell  
casing;

said first current collector and said second current  
collector, both formed from one or a combination of  
collector materials from a group of collector materials  
consisting of particle-dispersed plastic tape and  
plastic dispersed carbon tape;

actives added to said materials forming said first current  
collector and said second current collector whereby  
said first current collector is also a first electrode  
and said second current collector is also a second  
electrode; and

a separator in contact with said upper planar surface and said second planar surface, said separator sufficiently porous to allow passage of electrolyte in said interior cavity.

16. The improved battery cell as defined in claim 9 additionally comprising at least one of said first electrode and said second electrode being rendered fire retardant by addition of active fire retardant material to said active material added to said materials forming said first and said second current collectors.

17. The improved battery cell as defined in claim 16 wherein said active fire retardant material is comprised of one or a combination of active fire retardant materials from a group of active fire retardant materials consisting of aluminum trihydrate, magnesium hydroxide, decabromodiphenyl tetradecabromodiphenoxy benzene, lithium carbonate, ethylene bistetrabromophthalimide,  $\text{Li}_2\text{CO}_3$ ,  $\text{Na}_2\text{CO}_3$ , and  $\text{CaCO}_3$ .

18. The improved battery cell as defined in claim 16 additionally comprising:

means to bias the first current collector against the cell cap and concurrently bias the second current collector against the cell casing.

19. The improved battery cell as defined in claim 18 wherein said means to bias the first current collector against cell cap and concurrently bias said second current collector against said cell casing is provided by said material forming said first current collector and said material forming said second current collector being compressed when said cell casing is in said sealed communication with said cell cap and thereafter being in biased communication with said first current collector and said second current collector.

20. The improved battery cell as defined in claim 1 wherein said first electrode and said second electrode are formed of one or a combination of active materials from a group of active materials consisting of Li, Co, O, Ni, Mn, C, S, and Lithium metal.

21. The improved battery cell as defined in claim 5 wherein said first electrode and said second electrode are formed of one or a combination of active materials from a group of active materials consisting of Li, Co, O, Ni, Mn, C, S, and Lithium metal.

22. The improved battery cell as defined in claim 15 wherein said first electrode and said second electrode are formed of one or a combination of active materials from a group of active materials consisting of Li, Co, O, Ni, Mn, C, S, and Lithium metal.

23. The improved battery cell as defined in claim 1 wherein said cell is cylindrical in shape.

24. The improved battery cell as defined in claim 2 wherein said second current collector is formed of metallic material.

25. The improved battery cell as defined in claim 1 wherein said cell is prismatic having a plurality of positive and negative electrodes formed therein.

26. The improved battery cell as defined in claim 1 further comprising:

said battery cell charged upon manufacture to a maximum charge between 0 to 10% of the capacity of said battery cell whereby said battery cell may be shipped or stored without suffering corrosion or degradation.

27. The improved battery cell as defined in claim 5 further comprising:

said battery cell charged upon manufacture to a maximum charge between 0 to 10% of the capacity of said battery cell whereby said battery cell may be shipped or stored without suffering corrosion or degradation.

28. The improved battery cell as defined in claim 11 further comprising:

said battery cell charged upon manufacture to a maximum charge between 0 to 10% of the capacity of said battery cell whereby said battery cell may be shipped or stored without suffering corrosion or degradation.

29. An electrode apparatus for use in constructing a lithium ion battery cell comprising:

a first current collector formed of metallic foil and having  
a first planar surface and a second planar surface;  
said first planar surface in contact with a first conductor  
for communicating electrical current to and away  
therefrom;

a first electrode adhered to said second planar surface,  
said first electrode and said first current collector

thereby forming a unitary structure;  
a second current collector having an upper planar surface  
and a lower planar surface;  
said second current collector formed of non-metallic  
material from a group of materials consisting of  
particle-dispersed plastic tape and plastic dispersed  
carbon tape;  
said lower planar surface in contact a second conductor to  
communicate electrical current to and away therefrom;  
a second electrode adhered to said upper planar surface,  
said second current collector and said second electrode  
thereby forming a second unitary structure; and  
a separator in contact with said upper planar surface and  
said second planar surface, said separator sufficiently  
porous to allow passage of electrolyte therethrough.

30. An electrode apparatus for use in constructing a lithium ion  
battery cell comprising:

a first current collector having a first planar surface and a  
second planar surface;  
said first planar surface communicating with a first battery  
terminal exterior to said battery cell;  
a first electrode adhered to said second planar surface,

said first electrode and said first current collector  
thereby forming a unitary structure;  
a second current collector in said interior cavity having an  
upper planar surface and a lower planar surface;  
said lower planar surface communicating with a second battery  
terminal exterior to said battery cell;  
a second electrode adhered to said upper planar surface,  
said second current collector and said second electrode  
thereby forming a second unitary structure;  
said first current collector and said second current  
collector, both formed from one or a combination of materials  
from a group of materials consisting of  
particle-dispersed plastic tape, plastic dispersed  
carbon tape, fiber dispersed conductive plastic and  
carbon tape, particle and metallic powder dispersed  
conductive plastic; and  
a separator in contact with said upper planar surface and  
said second planar surface, said separator sufficiently  
porous to allow passage of electrolyte therethrough.

31. An electrode apparatus for use in constructing a lithium ion  
battery cell a cell having a cell casing in sealed insulated  
communication with a cell cap said sealed communication defining an

interior cavity comprising:

a first current collector in said interior cavity having a first planar surface and a second planar surface;  
said first planar surface in contact with said cell cap;  
a second current collector in said interior cavity having an upper planar surface and a lower planar surface;  
said lower planar surface in contact with said cell casing;  
said first current collector and said second current collector, both formed from one or a combination of collector materials from a group of collector materials consisting of particle-dispersed plastic tape and plastic dispersed carbon tape;  
actives added to said materials forming said first current collector and said second current collector whereby said first current collector is also a first electrode and said second current collector is also a second electrode; and  
a separator in contact with said upper planar surface and said second planar surface, said separator sufficiently porous to allow passage of electrolyte in said interior cavity.